GS-403 Microbiology Series GS-403

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: microbiology; or biology, chemistry, or basic medical science that included at least 20 semester hours in microbiology and other subjects related to the study of microorganisms, and 20 semester hours in the physical and mathematical sciences combining course work in organic chemistry or biochemistry, physics, and college algebra, or their equivalent.

OR

B. Combination of education and experience—courses equivalent to a major in microbiology, biology, chemistry, or basic medical science that included courses as shown in A above, plus appropriate experience or additional education.

Graduate Education: Microbiology, or specific area of study such as bacteriology, virology, mycology, algology, protozoology, parasitology, immunology, serology, microbial genetics, or soil microbiology; or specific applied fields of microbiology such as clinical and public health microbiology, food tech-nology, production processes, industrial fermentation, pollution, etc. Graduate study in related fields such as experimental pathology, infectious diseases, epidemiology, biochemistry, animal or plant physiology, genetics, plant pathology, and insect disease control, may also be pertinent, provided it has *direct application* to microbiological work.

Evaluation of Education: Microbiology is a broad field of science encompassing a number of scientific disciplines or areas of science, the fields in which this science is applied, and related fields where the work is concerned with or involves microbiology. The scientific disciplines or areas of this science include bacteriology, immunology, serology, algology, mycology, parasitology, protozoology, rickettsi-ology, tissue culture, virology, and similar disciplines or areas of science. The applied fields include environmental, food, dairy, soil, industrial, public health, clinical, and agricultural microbiology, and similar areas in which microbiology is applied. Related fields include taxonomy and systematics, plant, animal, or human physiology or pathology, infectious diseases, epidemiology, ecology, and similar areas of science *where the work is directly related or applies to microbiology*. Except where the course work deals with a limited and specific segment of the science, where it might be limited in usefulness, most of the work, including that dealing with the development and use of microbiological methods, procedures, and techniques, is qualifying. In interpreting the substantive value of the course work, credit may be given for courses in related fields, depending on the degree to which the courses are related to micro-biological work.

Evaluation of Experience: For positions at GS-9 that involve a substantial amount of work in a specific specialized area or applied field of microbiology, at least 6 months of the experience must either have been in the appropriate area of specialization or applied field of microbiology, or have direct application in the area for which the applicant is being considered. For the GS-11 and higher grade levels of such specialized positions, the experience must have been sufficiently specialized to insure adequate familiarity with the area of specialization or applied field of microbiology, or have direct application in the area for which the applicant is being considered.

Alternate requirement: For GS-14 clinical and public health microbiology positions, certification by the American Board of Medical Microbiology/American Board of Medical Laboratory Immunology, or election to Fellowship in the American Academy of Microbiology fully meets the experience requirement for such positions.

GS-404 Biological Science Technician Series GS-404

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Technical and Medical Support Positions."

Specialized Experience (for positions at GS-4 and above): Experience must have been related to the work of the position for which application is made. The specialized experience required for some positions in this series is normally work performed in a controlled environment. Examples of qualifying specialized experience include:

- Research activity or control program work.
- Nursery work that required the growing and maintenance of plants in a controlled environment.
- Work comparable to that with a large dairy farm where production records, animal environment, and sanitary conditions were kept in accordance with modern dairy practice.

Farming experience that was not performed in a controlled environment, or experience as a laborer who was not responsible for planning and scheduling his/her own work, but only performed assigned tasks, would not qualify as specialized experience.

OR

Education and Training:

For GS-3: Successful completion of 1 year of study that included at least 6 semester hours in any combination of scientific or technical courses such as biology, chemistry, statistics, entomology, animal husbandry, botany, physics, agriculture, or mathematics.

For GS-4: Successful completion of 2 years of study that included at least 12 semester hours in any combination of courses such as those shown above for GS-3. At least 6 semester hours of courses must be directly related to the position to be filled.

For GS-5: Successful completion of a full 4-year course of study leading to a bachelor's degree with major study or at least 24 semester hours in any combination of courses such as those shown above for GS-3. At least 6 semester hours of courses must have been directly related to the position to be filled. The successful completion of a full course of study of at least 12 months in a school for clinical laboratory technicians may be substituted for the 1 year of specialized experience required at the GS-5 level for positions involving microbiology and biochemistry technician work.

GS-405 Pharmacology Series GS-405

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements: Degree: major in an appropriate biological, medical, veterinary, or physical science, or in pharmacy that included at least 30 semester hours in chemistry and physiology and 12 semester hours in pharmacology.

Evaluation of Education: The positions in this series are multidisciplinary positions, since the work involves the application of a scientific knowledge of biochemistry, physiology, pharmacology, and such related sciences as microbiology, biophysics, genetics, mathematics, and statistics.

Courses in chemistry, organic chemistry, biochemistry, general physiology, and animal, human, microbial, or cellular physiology may be used to meet the 30-semester-hour requirement in chemistry and physiology. Under some circumstances, i.e., where the course work provided additional insight into the biophysical, biochemical, and physiological relationships involved, courses in such subjects as cytology, embryology, cellular or microbial genetics, and biophysics may be used to meet this requirement.

Courses in pharmacology, pharmacodynamics, pharmacotherapeutic, molecular pharmacology, and other similar subjects may be used to meet the 12-semester-hour requirement in pharmacology. Courses dealing intensively with pharmacologically-oriented subjects may also be used to meet this requirement.

GS-406 Agricultural Extension Series GS-406

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: major in agriculture, home economics, agricultural economics, entomology, soil science, plant science, animal science, or other biological or social science field related to the position to be filled.

OR

B. Combination of education and experience—courses equivalent to a major, or a combination of related courses totaling at least 24 semester hours, in one or more of the fields listed in A above, plus appropriate experience or additional education.

OR

C. Experience—four years of appropriate work experience that demonstrated that the applicant acquired a thorough knowledge of the subject-matter field of the position to be filled equivalent to that which would have been acquired through completion of a 4-year course of study as described in A above.

Evaluation of Education: Education in nonaccredited institutions will be accepted to the extent that the State university or a land-grant institution in the State in which the institution is located will credit the course work toward a degree. Graduate education in the same or a directly related specialty area as the position to be filled will be accepted for specialist positions up to the GS-11 level.

Evaluation of Experience: Specialized experience, particularly at the higher levels, must have provided knowledge of the theories and principles of extension educational programs. Such experience will usually have been gained in an extension setting or similar function involving programs that provide technical information and research results for practical application.

GS-408 Ecology Series GS-408

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements: Degree: biology, or a related field of science underlying ecological research that included at least 30 semester hours in basic and applied biological sciences. These hours must have included at least 9 semester hours in ecology, and 12 semester hours in physical and mathematical sciences.

GS-410 Zoology Series GS-410

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: zoology; or a related discipline or field of science that included at least 20 semester hours in zoology and related animal sciences.

OR

B. Combination of education and experience—courses equivalent to a major in zoology, or in a related discipline that included course work as shown in A above, plus appropriate experience or additional education.

Graduate Education: To be qualifying, graduate study must have been in one of the major fields of zoology, or have followed a curriculum or pattern of training that placed major emphasis on one of these disciplines or subject-matter fields, such as nematology or parasitology.

Graduate study in related fields of science such as microbiology, medicine, veterinary medicine, or plant pathology that involved cross-training in zoology or one of the fields of zoology may also be qualifying, provided there was a sufficient amount of emphasis on zoology.

GS-413 Physiology Series GS-413

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements: Degree: in one of the basic animal sciences or physiology; or a related discipline or field of science that included at least 24 semester hours in the basic animal sciences, of which 10 semester hours were in animal physiology.

Evaluation of Education: Courses such as anatomy; cytology; invertebrate and vertebrate zoology; embryology; entomology; animal, dairy, and poultry husbandry; nutrition; genetics; and physiology may be used to meet the 24-semester-hour requirement in the basic animal sciences.

Courses in physiology, animal or human physiology, cellular physiology, or courses that were well oriented toward animal or human physiology, e.g., some advanced courses in biochemistry, are qualifying as animal physiology courses. Courses in related fields such as cytology and microbiology (including microbial physiology) may also be qualifying, *provided* the course work dealt directly with the application of scientific principles underlying animal physiology, or with the methodology and techniques applied in animal physiology work.

GS-414 Entomology Series GS-414

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: entomology; or a related discipli ne of the biological or physical sciences that included at least 16 semester hours in entomology.

OR

B. Combination of education and ex perience—courses equivalent to a major that included course work as shown in A above, plus appropriate experience or additional education.

Evaluation of Education: Applicants with major fields of study in biology, zoology, or invertebrate zoology may fully meet the basic educational requirements if their academic preparation included substantiv e instruction (including appropriate laboratory and field work) in basic general entomology, taxonomy , physiology, ecology, general and organic chemistry, general physics, and mathematics or statistics tha t provided some training in the analysis of variables.

GS-415 Toxicology Series GS-415

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements: Degree: toxicology; or an appropriate discipline of the biological, medical, o r veterinary sciences that included at lea st 30 semester hours in chemistry, biochemistry, or physiology, and 12 semester hours in toxicology.

Evaluation of Education: The positions in this series are multidisciplinary positions because the work may involve the application of a scientific knowledge of anatomy, chemistry, biochemistry, physiology , pathology, toxicology, and related sciences such as microbiology, biophysics, entomology, genetics , mathematics, and statistics.

Applicants may have acquired a knowledge of the methods and techniques applied in performing toxi - cological work through various fields of scientific inquiry. Traditionally, academic training in toxicology has been given at the graduate level in connection with the work of a school of veterinary medicine or a school of medicine. Students who enter these schools directly after completing their undergraduat e programs are usually trained in anatomy, toxicology, pharmacology, biochemistry, or physiology. Many toxicologists enter the field after taking graduate work i n anatomy, biochemistry, chemistry, or physiology, and complete their doctoral program in these fields, or get their M.D. or Doctor of Veterinary Medicine. Typically, they then acquire experience or work toward a Ph.D. in toxicology.

Courses in anatomy, chemistry, organic chemistry, biochemistry, biology, histology, and animal, human, microbial, or cellular physiology may be used to meet the 30-semester-hour requirement in chemistry , biochemistry, and physiology. Courses in statistics, bioassay, and test design may also apply to thi s requirement. Courses in cytology , embryology, cellular or microbial genetics, and biophysics may also be used to meet this requirement in those instances w here the course work provided additional insight into the biophysical, biochemical, and physiological relationships involved. Only toxicology courses may be used to meet the requirement for 12 semester hours in toxicology. This may include courses dealing intensively with toxicological search, methods in toxicology, essentials of toxicology, the study and review o f toxicological literature, special reading courses, or other toxicologically-oriented subjects.

GS-421 Plant Protection Technician Series GS-421

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Technical and Medical Support Positions."

Specialized Experience (for positions at GS-4 and above): Qualifying specialized experience must have provided familiarity with the methods, procedures, and techniques involved in inspecting, detecting, identifying, eradicating, suppressing, or controlling plant pests, and in the enforcement of Federal and State quarantines. Examples of qualifying specialized experience include:

- Inspecting nursery plants for the presence of a specific plant pest.
- Surveying areas for specific plant pests or for the presence of alternate plant hosts.
- Developing rough maps showing control or eradication treatment completed, areas surveyed, or pest finds located.
- Performing survey control or eradication procedures in a local pest control program.
- Answering questions regarding plant pest control procedures, harmful side-effects of pesticides to other living organisms, etc.
- Inspecting vehicles in the enforcement of plant quarantine regulations.
- Performing laboratory work involved with raising and/or sterilizing various insects.

OR

Education and Training:

For GS-3: Successful completion of 1 year of study that included at least 4 semester hours in courses such as biology, plant pathology, entomology, zoology, botany, forestry, chemistry, agri-culture, or physics.

For GS-4: Successful completion of 2 years of study that included at least 8 semester hours in courses such as those shown above for GS-3.

For GS-5: Successful completion of 4 years of study that included at least 16 semester hours in courses such as those shown above for GS-3.

GS-430 Botany Series GS-430

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: botany; or basic plant science that included at least 24 semester hours in botany.

OR

B. Combination of education and experience—courses equivalent to a major in botany or basic plant science that included at least 24 semester hours in botany, as shown in A above, plus appropriate experience or additional education.

For positions dealing with the study of fungi, or with basic mycological relationships, the course work in botany must have included at least 6 semester hours in mycology.

Evaluation of Education: Courses in basic botany, plant anatomy or morphology, cytology, histology, genetics, taxonomy or systematics, algology, mycology, ethnobotany, and those dealing with specific problems of a botanical nature or with specific groups of plants are qualifying. The courses required for mycologists are specific and must have been in mycology.

GS-434 Plant Pathology Series GS-434

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements: Degree: plant pathology; or a related scientific discipline that included at least 20 semester hours in basic botany or plant science, and 10 semester hours in plant pathology.

Graduate Education: Must have been in plant pathology, or in one of the recognized subject-matter fields of plant pathology, or have followed a curriculum or pattern of training that placed major emphasis on plant pathology or one of the recognized subject-matter fields of plant pathology, such as those dealing with particular types of pathogens, diseases of particular kinds of crops, or chemical or biological controls. Graduate study in related fields such as microbiology, entomology, plant physiology, genetics, agronomy, horticulture, forestry, or chemistry may also be qualifying, *provided* it placed a sufficient amount of emphasis on plant pathology.

Evaluation of Education: Courses in botany, plant physiology, plant taxonomy, plant pathology, agronomy, forestry, horticulture, or similar subjects may be used to meet the 20-semester-hour requirement in basic botany or plant science. To meet the specific 10-semester-hour requirement in plant pathology, the courses must have been in plant pathology, or have dealt with specific subject matter areas of plant pathology such as those concerned with viruses, fungal or bacterial diseases, host-plant relationships, biotic or chemical controls, environmental or physiological diseases, parasitic diseases, etc.

GS-435 Plant Physiology Series GS-435

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements: Degree: botany or plant physiology; or a related scientific discipline that included at least 10 semester hours in plant physiology.

Evaluation of Education: The 10-semester-hour requirement in plant physiology is specific. Course work is qualifying if it dealt with plant physiology, some phase of plant physiology, or methods and techniques applied in plant physiology work. Other course work in borderline areas should be evaluated on the basis of content.

GS-436 Plant Protection and Quarantine Series GS-436

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: major in biological science, agriculture, or a closely related field appropriate to the position that included at least 20 semester hours in such course work as agronomy, cell biology, botany, entomology, forestry, horticulture, mycology, nematology, plant pathology, soil science, or other closely related courses.

OR

B. Combination of education and experience—courses equivalent to a major in biological science, agriculture, or a closely related field, including at least 20 semester hours of course work as described in A above, plus appropriate experience or additional education.

GS-437 Horticulture Series GS-437

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: horticulture; or a related discipline of basic plant science that included at least 30 semester hours in the basic plant sciences, of which at least 16 semester hours were in horticultural subjects such as those dealing with the breeding, care, management, production, and post harvest handling of horticultural crops.

OR

B. Combination of education and experience—courses equivalent to a major in horticulture or a related discipline of basic plant science that included course work as shown in A above, plus appropriate experience or additional education.

Evaluation of Education: Courses in botany, plant physiology, plant taxonomy, plant pathology, genetics, agronomy, horticulture, and similar courses may be used to meet the 30-semester-hour requirement in basic plant sciences.

The 16-semester-hour requirement in horticulture includes course work in basic horticulture and course work related to any of the recognized subject-matter fields of horticulture, i.e., fruits, vegetables, ornamentals, nursery work, seed production, or course work in related areas of science, such as microbiology, entomology, plant pathology, plant physiology, or genetics that is directly related to horticultural work.

GS-440 Genetics Series GS-440

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements: Degree: genetics; or one of the basic biological sciences that included at least 9 semester hours in genetics.

Graduate Education: Genetics, or a curriculum or pattern of training that placed major emphasis on genetics. Graduate study in related fields such as agronomy, horticulture, animal, dairy, or poultry husbandry, entomology, microbiology, plant pathology, chemistry, molecular and cellular biology, and physiology that involved cross-training in genetics is qualifying, *provided* it placed sufficient emphasis on genetics.

Evaluation of Education: Most students in the field take graduate work because specific training in genetics may be limited at the undergraduate level. Under these circumstances, it may be necessary to evaluate undergraduate course work in genetics in one of two ways, as described below, to determine whether or not it is qualifying.

(1) Courses dealing with genetics, some phase of genetics, or specific techniques that are applied in genetics work are acceptable. This includes courses in genetics, plant or animal genetics, molecular and cellular biology, mathematics and statistics (as they apply to genetics), population dynamics, and certain techniques such as those dealing with irradiation.

(2) Course work consisting of an appropriate combination of basic courses in genetics and cytology or statistics are also acceptable.

GS-454 Rangeland Management Series GS-454

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: range management; or a related discipline that included at least 42 semester hours in a combination of the plant, animal, and soil sciences, and natural resources management, as follows:

- *Range Management*—At least 18 semester hours of course work in range management, including courses in such areas as basic principles of range management, range plants, range ecology, range inventories and studies, range improvements, and ranch or rangeland planning.
- *Directly Related Plant, Animal, and Soil Sciences*—At least 15 semester hours of directly related courses in the plant, animal, and soil sciences, including at least one course in each of these three scientific areas, i.e., plant, animal, and soil sciences. Courses in such areas as plant taxonomy, plant physiology, plant ecology, animal nutrition, livestock production, and soil morphology or soil classification are acceptable.
- *Related Resource Management Studies*—At least 9 semester hours of course work in related resource management subjects, including courses in such areas as wildlife management, watershed management, natural resource or agricultural economics, forestry, agronomy, forages, and outdoor recreation management.

OR

B. Combination of education and experience—at least 42 semester hours of course work in the combination of plant, animal, and soil sciences and natural resources management shown in A above, plus appropriate experience or additional education.

GS-455 Range Technician Series GS-455

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Technical and Medical Support Positions."

Specialized Experience (for positions at GS-4 and above): In addition to the experience requirements described in the group coverage standard, seasonal experience may also be creditable. A season of experience is considered to be a period of no less than 3 months of continuous employment on a seasonal basis. Shorter periods may be combined to make a season, provided a total of at least 3 months' experience is shown. For any period where the work exceeded 3 months, the excess work is credited towards an additional season of experience. One season of experience is qualifying for GS-2; 2 seasons of experience qualify for GS-3; and 4 seasons of experience qualify for GS-4. Examples of qualifying specialized experience include:

- Work in the conservation, regulation, and use of public or Federally controlled lands for grazing.
- Range research activities.
- Work in the operation of a livestock ranch or in assisting in the management or preservation of lands comparable to the public range.
- Range or forest fire control, prevention, or suppression work.

OR

Education and Training:

For GS-3: Successful completion of 1 year of study that included at least 6 semester hours in a combination of courses such as range management or conservation, agriculture, forestry, wildlife management, engineering, biology, mathematics, or other natural or physical sciences.

For GS-4: Successful completion of 2 years of study that included at least 12 semester hours in any combination of courses such as forestry, agriculture, crop or plant science, range management or conservation, wildlife management, watershed management, soil science, natural resources (except marine fisheries and oceanography), outdoor recreation management, civil or forest engineering, or wildland fire science. No more than 3 semester hours in mathematics is creditable.

For GS-5: Successful completion of a full 4-year course of study leading to a bachelor's degree (a) with major study in forestry, range management, agriculture, or a subject-matter field directly related to the position, or (b) that included at least 24 semester hours in any combination of courses such as those shown above for GS-4. No more than 6 semester hours in mathematics is creditable.

GS-457 Soil Conservation Series GS-457

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: soil conservation or related agricultural or natural resource discipline such as agronomy, soil science, forestry, agricultural education, or agricultural engineering. The study must have included 30 semester hours in a natural resource or agricultural field, including at least 12 semester hours in a combination of soils and crops or plant science. Of the 12 semester hours, a minimum of 3 semester hours must have been in soils and 3 semester hours in crops or plant science.

OR

B. Combination of education and experience—at least 30 semester hours in one or more of the disciplines as shown in A above, including at least 12 semester hours in a combination of soils and crops or plant science, plus appropriate experience or additional education. Of the 12 semester hours, a minimum of 3 semester hours must have been in soils and 3 semester hours in crops or plant science.

Evaluation of Education: Education that provided specialized knowledge and skills in soil and water conservation is more valuable than education that imparted broad but general knowledge and skills. Courses in soil fertility, soil chemistry, soil genesis, plant physiology, plant science, and field crops are examples of specialized courses that contribute towards meeting the required 12 semester hours as described above. Courses in the physical sciences or engineering such as geology, civil engineering, and hydrology also meet the soils, crops, or plant science course requirements where such courses included a complete introduction to the physical, chemical, and biological properties of soils.

Evaluation of Experience: Experience that included the application of techniques, principles, and methods from a variety of agricultural and natural resource fields is appropriate, given the interdisciplinary character of the soil conservation occupation. For example, experience gained in a specialized field such as soil science, forestry, or agronomy is as fully acceptable as experience directly obtained in soil conservation work.

GS-458 Soil Conservation Technician Series GS-458

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Technical and Medical Support Positions."

Specialized Experience (for positions at GS-4 and above): In addition to the experience requirements described in the group coverage standard, seasonal experience may also be creditable. A season of experience is considered to be a period of no less than 3 months of continuous employment on a seasonal basis. Shorter periods may be combined to make a season, provided a total of at least 3 months' experience is shown. For any period where the work exceeded 3 months, the excess work is credited towards an additional season of experience. One season of experience is qualifying for GS-2; 2 seasons of experience qualify for GS-3; and 4 seasons of experience qualify for GS-4. Examples of qualifying specialized experience include:

- Installing and maintaining conservation measures on public or privately owned land including parks, shoreline, refuse waste sites, dams and reservoir areas, water and sewer sites, road embankments, forests, and wildlife habitats.
- Installing and maintaining soil and water conservation measures on farms, ranches, or agricultural land.

OR

Education and Training:

For GS-3: Successful completion of 1 year of study that included at least 6 semester hours in a combination of courses such as range management or conservation, agriculture, forestry, wildlife management, engineering, biology, mathematics, or other natural or physical sciences.

For GS-4: Successful completion of 2 years of study that included at least 12 semester hours in any combination of courses such as forestry, agriculture, crop or plant science, range management or conservation, wildlife management, watershed management, soil science, natural resources (except marine fisheries and oceanography), outdoor recreation management, civil or forest engineering, or wildland fire science. No more than 3 semester hours in mathematics is creditable.

For GS-5: Successful completion of a full 4-year course of study leading to a bachelor's degree (a) with major study in forestry, range management, agriculture, or a subject-matter field directly related to the position, or (b) that included at least 24 semester hours in any combination of courses such as those shown above for GS-4. No more than 6 semester hours in mathematics is creditable.

GS-459 Irrigation System Operation Series GS-459

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Technical and Medical Support Positions."

Specialized Experience (for positions at GS-4 and above): Examples of qualifying specialized experience include:

- Farming or ranching work that provided knowledge of soil and water conservation practices an d irrigation procedures used in the geographical area for which application is made.
- Construction, maintenance, or operating work that provided a knowledge of the control, regulation , distribution, and measurement of water.
- Controlling, clearing, repairing, and maintaining irrigation ditches, canals, and equipment; or soi l conservation or engineering technician work where the duties provided a knowledge of irrigatio n procedures.

OR

Education and Training:

For GS-3: Successful completion of l year of study that included at least one course in subjects such a s civil engineering, agriculture, soil management or conservation, physical science, mathe-matics, or range management or conservation.

For GS-4: Successful completion of 2 years of study that included at least 12 semester hours in an y combination of courses such as those shown above for GS-3.

For GS-5: Successful completion of a full 4-year course of study leading to a bachelor's degree with major study or at least 24 semester hours in any combination of courses such as those shown above for GS-3.

GS-460 Forestry Series GS-460

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: forestry; or a related subject-matter field that included a total of at least 30 semester hours in any combination of biological, physical, or mathematical sciences or engineering, of which at least 24 semester hours of course work were in forestry. The curriculum must have been sufficiently diversified to include courses in each of the following areas:

- *Management of Renewable Resources*—study of the science and art of managing renewable resources to attain desired results. Examples of creditable courses in this area include silviculture, forest management operations, timber management, wildland fire science or fire management, utilization of forest resources, forest regulation, recreational land management, watershed management, and wildlife or range habitat management.
- *Forest Biology*—study of the classification, distribution, characteristics, and identification of forest vegetation, and the interrelationships of living organisms to the forest environment. Examples of creditable courses in this area include dendrology, forest ecology, silvics, forest genetics, wood structure and properties, forest soils, forest entomology, and forest pathology.
- *Forest Resource Measurements and Inventory*—sampling, inventory, measurement, and analysis techniques as applied to a variety of forest resources. Examples of creditable courses include forest biometrics, forest mensuration, forest valuation, statistical analysis of forest resource data, renewable natural resources inventories and analysis, and photogrammetry or remote sensing.

OR

B. Combination of education and experience—courses equivalent to a major in forestry, or at least 30 semester hours in any combination of biological, physical, or mathematical sciences or engineering, of which at least 24 semester hours were in forestry. The requirements for diversification of the 24 semester hours in forestry are the same as shown in A above, plus appropriate experience or additional education.

Applicants for *Forester (Administration)* or *Research Forester (Administration)* must have completed either the requirements described in A or B above; or the minimum educational requirements established for other forestry-related professional disciplines, e.g., Range Conservationist, GS-454; Soil Scientist, GS-470; Wildlife Biologist, GS-486; Geologist, GS-1350; Landscape Architect, GS-807; Hydrologist, GS-1315; or the full 4-year college requirements described for All Professional Engineering Positions, GS-800, *provided* that the basic professional training was supplemented by a sufficient amount of professional experience gained in a forestry work situation. The supplemental experience must have been gained in a work situation where the program or project required the joint application of full professional knowledge of forestry and the related professions in the solving of highly technical and complex problems; where the work was largely concerned with the planning, developmental, and administrative phases of multiple-use, forest land management programs; or with the carrying out of related research or special projects of a similar nature.

FOR DEPARTMENT OF THE INTERIOR POSITIONS WITH PILOT DUTIES

Applicants must:

- Possess a current FAA Commercial Airman Certificate with ratings appropriate for the duties performed;
- Possess an instrument rating;
- Have completed a minimum of 500 hours of flight time as Pilot-in-Command and 25 hours of flight time as Pilot-in-Command at night; and

- Possess a current Class II Medical Certificate.

GS-462 Forestry Technician Series GS-462

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Technical and Medical Support Positions."

Specialized Experience (for positions at GS-4 and above): In addition to the experience requirements described in the group coverage standard, seasonal experience may also be creditable. A season of experience is considered to be a period of no less than 3 months of continuous employment on a seasonal basis. Shorter periods may be combined to make a season, provided a total of at least 3 months' experience is shown. For any period where the work exceeded 3 months, the excess work is credited towards an additional season of experience. One season of experience is qualifying for GS-2; 2 seasons of experience qualify for GS-3; and 4 seasons of experience qualify for GS-4. Examples of qualifying specialized experience include:

- Forestry aid or technician work.
- Engineering, range, or soil conservation technician work that involved the application of cultural, resource conservation, or land management practices on nonforest or ranch lands when combined with knowledge of forestry operations and equipment.
- Farming or ranching work that involved application of cultural and soil and water conservation practices, including safety and use of equipment, and that provided a basic understanding of land use.
- Forest or range fire control, prevention, or suppression work.

OR

Education and Training:

For GS-3: Successful completion of 1 year of study that included at least 6 semester hours in a combination of courses such as range management or conservation, agriculture, forestry, wildlife management, engineering, biology, mathematics, or other natural or physical sciences.

For GS-4: Successful completion of 2 years of study that included at least 12 semester hours in any combination of courses such as forestry, agriculture, crop or plant science, range management or conservation, wildlife management, watershed management, soil science, natural resources (except marine fisheries and oceanography), outdoor recreation management, civil or forest engineering, or wildland fire science. No more than 3 semester hours in mathematics is creditable.

For GS-5: Successful completion of a full 4-year course of study leading to a bachelor's degree (a) with major study in forestry, range management, agriculture, or a subject-matter field directly related to the position, or (b) that included at least 24 semester hours in any combination of courses such as those shown above for GS-4. No more than 6 semester hours in mathematics is creditable.

FOR DEPARTMENT OF THE INTERIOR POSITIONS WITH PILOT DUTIES

Applicants must:

- Possess a current FAA Commercial Airman Certificate with ratings appropriate for the duties performed;
- Possess an instrument rating;
- Have completed a minimum of 500 hours of flight time as Pilot-in-Command and 25 hours of flight time as Pilot-in-Command at night; and
- Possess a current Class II Medical Certificate.

MEDICAL REQUIREMENTS FOR SMOKEJUMPER POSITIONS

The duties of these positions require sustained, arduous physical exertion under rigorous and unusual conditions. Persons appointed will be potentially subject to extreme physical danger and to irregular and protracted hours or work. The health of individuals must be such that they have the capacity to meet

demands for performance in the position and for human reliability. Before entrance on duty and periodically during employment, individuals must undergo a medical examination. Failure to meet any of the required medical qualifications will usually be considered disqualifying for employment or a basis for termination, except when substantial evidence is presented that the individuals can perform the essential functions of the job efficiently and without hazard to themselves or others, with or without reasonable accommodation.

GS-462 (Continued)

The following medical conditions must be met:

Eyes: Individuals must be free from acute or chronic eye disease. Corrected distant vision must test at least 20/20 (Snellen) in one eye and at least 20/30 (Snellen) in the other. Individuals must be able to read printed material the size of typewritten characters, correction permitted.

Ears: Individuals must not have acute or chronic disease of the external, middle, or internal ear. Using an audiometer for measurement, there should be no loss of 25 or more decibels in each ear at the speec h frequency range. A hearing aid is not permitted.

Nose, Mouth, and Throat: Individuals must be free from acute or chronic sinus disease or othe r nasopharyngeal conditions that interfere with distinct speech or with free breathing.

Teeth: Individuals must be free from any mouth or dental defect that interferes with proper incision and mastication of food.

Lungs: Individuals must not have any acute or chronic disease of the lungs that impairs pulmonary function.

Heart and Blood Vessels: Individuals must not have organic heart disease, compensated or not; valvular diseases; coronary heart disease; cardiac enlargement; angina pectoris; cardiac arrhythmia or irregularity other than sinus arrhythmia; arteriosclerosis; blood pressure readings that con
sistently exceed 150 systolic or 90 diastolic. High blood pressure that is regulated without side effects to no more than the above systolic and diastolic readings may be qualifying.

Abdomen: Individuals cannot have acute or chronic disease of the abdomen; significant enlargement of the liver or spleen; or hernia that interferes with lifting, stretching, bending, or working with tools.

Genitourinary/metabolic: Individuals cannot have acute or chronic genitourinary disease; acute or chronic prostatitis; large and/or painful varicocele or hydrocele with functional impairment; or unreconcile d abnormal finding on urinalysis, including drug use. Diabetes mellitus may be disqualifying if means o r extent of treatment and control are incompatible with working conditions.

Spine, Pelvis, Sacroiliac, and Lumbosacral Joints: Individuals must not have restricted mobility of th e spine and pelvic joints that interfere with normal function. Individuals ca nnot have any significant abnormal curvature of the spine or deformity or malformation of the parts , spondylolisthesis, or a history of herniated nucleus pulposus, with or without surgery, that may be reinjured on impact landing.

Extremities: Individuals cannot have anomalies in the number, form, proportion, and movement of th e extremities that interfere with function. This includes non-united fractures; nonreducible dislocations ; united fractures and reduced dislocations with incomplete r estoration of function; amputation of arm, hand, leg, or foot; loss of any skeletal portion of the thumb of either hand; loss of more than the two dista l phalanges of the ring or little fingers of either hand; ankylosed joints; pes cavus, weakfoot, or clubfoot ; flatfoot with symptoms unresponsive to orthotics; loss or deformity of gr eat toe or any two toes on the same foot; torn cartilage or loose foreign bodies within the knee joint; instability of the knee joint; o r inadequately healed surgical procedure.

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GS-462 (Continued)

Nervous System: Individuals must not have mental, nervous, organic, or functional neuro-psychiatri c disorders likely to interfere with performance; medical history or clinical diagnosis or a seizure disorder showing systems that are likely to recur or disturbance of consciousness without satisfactory explanation of the cause; paralysis or paresis; muscular atrophies or dystrophies that would interfere with prope r functioning in the position.

Skin: Individuals cannot have debilitating acute or chronic skin disease or extensive scarring that interferes with function.

Other conditions: Conditions or other diseases not included herein will not exclude an individual fro m consideration providing the condition is satisfactorily corrected.

Height: Height without shoes must not exceed 77 inches or be less than 60 inches.

Weight: Individuals must weigh no less than 120 pounds and no more than 200 pounds without clothes.

Immunization: A tetanus immunization or tetanus booster within the last 10 years is required.

GS-470 Soil Science Series GS-470

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: soil science or a closely related discipline that included 30 semester hours or equivalent i n biological, physical, or earth science, with a minimum of 15 semester hours in such subjects as soi l genesis, pedology, soil chemistry, soil physics, and soil fertility.

OR

B. Combination of education and experience—courses equivalent to a major in soil science or a relate d discipline that included at least 30 semester hours in the biological, physical, or earth sciences. At least 15 of these semester hours must have been in the areas specified in A ab ove, plus appropriate experience or additional education.

GS-471 Agronomy Series GS-471

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: agronomy; or related discipline of science that included at least 30 semester hours of course work in the basic plant sciences, including at least 15 semester hours in agronomic subjects, such as those dealing with plant breeding, crop production, and soil and crop management.

OR

B. Combination of education and experience—at least 30 semester hours in the basic plant sciences, including a minimum of 15 semester hours in agronomic subjects, as shown in A above, plus appropriate experience or additional education.

Graduate Education: Agronomy, or one of the related disciplines or fields of science, such as plant physiology, soils, or genetics, where the curriculum or pattern of training placed major emphasis on field crops or agronomy. Graduate study in related fields, such as botany, plant pathology, and biochemistry may also be qualifying, *provided* it placed a sufficient amount of emphasis on agronomy.

Evaluation of Education: Course work in such subjects as botany, plant taxonomy, plant physiology, plant breeding or genetics, plant ecology, plant pathology, microbiology, agronomy, or those dealing with basic soil-water-plant relationships of an agronomic or ecologic nature may be used to meet the 30-semester-hour requirement in the basic plant sciences. Agronomy courses include agronomy, fieldcrops, field crop production or management, soil and crop management, plant breeding and development, weed control, and similar courses, including those in soils, biochemistry, plant physiology, etc., *provided* they dealt with principles, methods, or procedures that are applied directly in agronomic work and in the solving of agronomic problems.

GS-475 Agricultural Management Series GS-475

This is an individual qualification standard.

EDUCATION AND EXPERIENCE REQUIREMENTS

The following table shows the amounts of education and/or experience required to qualify for positions covered by this standard.

GRADE	EDUCATION OR EXPERIENCE		
		General	**Specialized**
GS-5	4-year course of study above high school leading to a bachelor's degree	3 years, 1 year of which was equivalent to at least GS-4	None
GS-7	1 full academic year of graduate education or law school *or* superior academic achievement	None	1 year equivalent to at least GS-5
GS-9	2 full academic years of progressively higher level graduate education *or* master's or equivalent graduate degree or LL.B. or J.D.	None	1 year equivalent to at least GS-7
GS-11	3 full academic years of progressively higher level graduate education *or* Ph.D. or equivalent doctoral degree	None	1 year equivalent to at least GS-9
GS-12 and above	None	None	1 year equivalent to at least next lower grade level

Equivalent combinations of education and experience are qualifying for all grade levels for which both education and experience are acceptable.

EDUCATION

Undergraduate and Graduate Education: Major study—farm, livestock, or ranch management; agricultural economics; agricultural management; agricultural education; agricultural engineering; agricultural resources management; general agriculture; agronomy or crop science; animal, dairy, or poultry husbandry; non-ornamental horticulture; business; finance; financial management; business management; economics; accounting; or other fields related to the position to be filled.

OR

EXPERIENCE

General Experience (for GS-5 positions): Experience that provided an understanding of the fundamental principles and techniques of agricultural management and of the principles and practices of credit and finance or other work appropriate to the position to be filled. Examples of qualifying general experience include:

- Responding to questions about agricultural loans or specific agricultural practices related to soils, animal science, pesticides, and equipment.
- Determining whether applicants for loans meet established eligibility criteria.
- Establishing and maintaining effective relationships with representatives of financial organizations, farm associations, and farm borrowers to obtain information.
- Experience that demonstrates that the applicant understands farm or ranch operations.
- Serving as a loan or bank assistant in a lending institution.

GS-475 (Continued)

Specialized Experience (for positions above GS-5): Experience that demonstrated a knowledge of the principles and practices of agricultural production, practical approaches of producers to the marketing of their agricultural products, and sources of information concerning these subjects. This experience must also have demonstrated a knowledge of credit principles and practices, and of Federal agricultural programs. Examples of qualifying specialized experience include:

- Applying appropriate credit principles and practices in determining the viability of agricultural operations.
- Solving farm production and marketing problems to enhance productivity and financial conditions.
- Providing advice to borrowers on the productivity and profitability of enterprises.
- Adjudicating loans where the work provided a knowledge of agricultural concepts, principles, laws, and regulations.
- Surveying markets to ascertain the production opportunities for and credit-worthiness of products.
- Making assessments of the progress of crops, health and condition of livestock, and other conditions affecting agricultural operations.
- Making judgments based on financial management concepts, principles, laws, and regulations.
- Operating a farm or business.
- Experience that demonstrates a working knowledge of agricultural marketing and production.

GS-480 General Fish and Wildlife Administration Series GS-480

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: biological sciences, agriculture, natural resource management, chemistry, or related disciplines appropriate to the position.

OR

B. Combination of education and experience—Courses equivalent to a major, or at least 30 semester hours in courses, as shown in A above, plus appropriate experience or additional education.

OR

C. Four years of experience that demonstrated that the applicant acquired knowledge and understanding of one or more of the biological sciences, agriculture, natural resource management, or related disciplines equivalent to that which would have been acquired through completion of a 4-year course of study as described in A above.

FOR DEPARTMENT OF THE INTERIOR POSITIONS WITH PILOT DUTIES

Applicants must:

- Possess a current FAA Commercial Airman Certificate with ratings appropriate for the duties performed;
- Possess an instrument rating;
- Have completed a minimum of 500 hours of flight time as Pilot-in-Command and and 25 hours of flight time as Pilot-in-Command at night; and
- Possess a current Class II Medical Certificate.

GS-482 Fishery Biology Series GS-482

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:
Nonresearch Positions:

A. Degree: major in biological science that included:
- At least 6 semester hours in aquatic subjects such as limnology, ichthyology, fishery biology, aquatic botany, aquatic fauna, oceanography, fish culture, or related courses in the field of fishery biology; and
- At least 12 semester hours in the animal sciences in such subjects as general zoology, vertebrate zoology, comparative anatomy, physiology, entomology, parasitology, ecology, cellular biology, genetics, or research in these fields. (Excess course work in aquatic subjects may be used to meet this requirement when appropriate.)

OR

B. Combination of education and experience—courses equivalent to a major in biological science (i.e., at least 30 semester hours), of which a minimum of 6 semester hours were in aquatic subjects and 12 semester hours were in the animal sciences, as shown in A above, plus appropriate experience or additional education.

Research Positions: Applicants must show that they have a degree with major study in biology, zoology, or biological oceanography that included at least 30 semester hours in biological and aquatic science and 15 semester hours in the physical and mathematical sciences. This course work must have included:
- At least 15 semester hours of preparatory training in zoology beyond introductory biology or zoology in such courses as invertebrate zoology, comparative anatomy, histology, physiology, embryology, advanced vertebrate zoology, genetics, entomology, and parasitology; and
- At least 6 semester hours of training applicable to fishery biology in such subjects as fishery biology, ichthyology, limnology, oceanography, algology, planktonology, marine or fresh water ecology, invertebrate ecology, principles of fishery population dynamics, or related course work in the field of fishery biology; and
- At least 15 semester hours of training in any combination of two or more of the following: chemistry, physics, mathematics, or statistics.

FOR DEPARTMENT OF THE INTERIOR POSITIONS WITH PILOT DUTIES
Applicants must:
- Possess a current FAA Commercial Airman Certificate with ratings appropriate for the duties performed;
- Possess an instrument rating;
- Have completed a minimum of 500 hours of flight time as Pilot-in-Comm and and 25 hours of flight time as Pilot-in-Command at night; and
- Possess a current Class II Medical Certificate.

GS-485 Wildlife Refuge Management Series GS-485

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: zoology, wildlife management, or an appropriate field of biology that included at least 9 semester hours in zoology; 6 semester hours in such wildlife courses as mammalogy, ornithology, animal ecology, or wildlife management; and 9 semester hours in botany.

OR

B. Combination of education and experience—courses equivalent to a major in one of the fields described in A above that included at least 9 semester hours in zoology; 6 semester hours in such wildlife courses as mammalogy, ornithology, animal ecology, or wildlife management; and 9 semester hours in botany, plus appropriate experience or additional education.

Additional Requirements for Positions Involving Pilot Duties: For positions in this series that require piloting an aircraft, applicants must:

- Possess a current FAA Commercial Pilot's Certificate with appropriate ratings for single-engine aircraft operation on both land and water;
- Have a minimum of 500 hours of solo flight time in command of aircraft, not less than 100 hours of which was in cross-country time; and
- Meet the medical requirements prescribed for possession of the necessary pilot's license.

FOR DEPARTMENT OF THE INTERIOR POSITIONS WITH PILOT DUTIES

Applicants must:

- Possess a current FAA Commercial Airman Certificate with ratings appropriate for the duties performed;
- Possess an instrument rating;
- Have completed a minimum of 500 hours of flight time as Pilot-in-Command and and 25 hours of flight time as Pilot-in-Command at night; and
- Possess a current Class II Medical Certificate.

GS-486 Wildlife Biology Series GS-486

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:
Nonresearch positions:

A. Degree: biological science that included:
- At least 9 semester hours in such wildlife subjects as mammalogy, ornithology, animal ecology, wildlife management, or research courses in the field of wildlife biology; and
- At least 12 semester hours in zoology in such subjects as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics, ecology, cellular biology, parasitology, entomology, or research courses in such subjects (Excess courses in wildlife biology may be used to meet the zoology requirements where appropriate.); and
- At least 9 semester hours in botany or the related plant sciences.

OR

B. Combination of education and experience—equivalent to a major in biological science (i.e., at least 30 semester hours), with at least 9 semester hours in wildlife subjects, 12 semester hours in zoology, and 9 semester hours in botany or related plant science, as shown in A above, plus appropriate experience or additional education.

Research positions: Degree with major in wildlife biology, zoology, or botany that included at least 30 semester hours of course work in biological science and 15 semester hours in the physical, mathematical, and earth sciences. This course work must have included:
- At least 9 semester hours of training applicable to wildlife biology in such subjects as mammalogy, ornithology, animal ecology, wildlife management, principles of population dynamics, or related course work in the field of wildlife biology; and
- At least 12 semester hours in zoological subjects such as invertebrate zoology, vertebrate zoology, comparative anatomy of the vertebrates, embryology, animal physiology, entomology, herpetology, parasitology, and genetics; and
- At least 9 semester hours in the field of botany and related plant science; and
- At least 15 semester hours of training in any combination of two or more of the following: chemistry, physics, mathematics, statistics, soils, and/or geology.

FOR DEPARTMENT OF THE INTERIOR POSITIONS WITH PILOT DUTIES
Applicants must:
- Possess a current FAA Commercial Airman Certificate with ratings appropriate for the duties performed;
- Possess an instrument rating;
- Have completed a minimum of 500 hours of flight time as Pilot-in-Command and and 25 hours of flight time as Pilot-in-Command at night; and
- Possess a current Class II Medical Certificate.

GS-487 Animal Science Series GS-487

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: animal science, dairy science, poultry science; or a related discipline or field of anima l science that included at least 30 semester hours in the basic biological and agricultural sciences, and 20 semester hours in animal science.
   - For animal scientist positions, at least 1 0 of the required 20 semester hours in animal science must have been in courses dealing with the breeding, fee ding, production, and management of livestock, and the care and preparation of their products.
   - For dairy scientist positions, at least 10 of the required 20 semester hours in animal science must have been in dairy science.
   - For poultry scientist positions, at least 10 of the required 20 semester hours in animal science must have been in poultry science.

OR

B. Combination of education and exper ience—courses equivalent to a major in the basic biological and agricultural sciences, including a minimum of 20 semester hours in appropriate animal scienc e subjects, as described in A above, plus appropriate experience or additional education.

Most universities offering appropr iate programs confer degrees in "animal science" rather than in "animal husbandry," although some universities still confer degrees in "animal husbandry." Therefore, reference to course work in respective animal, dairy, or poultry husbandry, *where applicable,* may be considered synonymous with corresponding course work in animal, dairy, or poultry science.

Graduate Education: To be qualifying, graduate stu dy must have been in animal, dairy, or poultry science; or in a specialized subject-matter area of science directly related to these sciences, such as feeds an d feeding or nutrition, breeding, and development, physiology, or genetics, where the curriculum or pattern of training placed major emphasis on one of the recognized specialized subject-matter areas of animal , dairy, or poultry science.

Graduate study in related disciplines or fields of science, such as agronomy, microbiology, biochemistry, biophysics, and dairy, food, or fiber technology (if it dealt with pertinent products or their production) may also be qualifying, *provided* the graduate work placed a sufficient amount of emphasis on one of th e recognized fields or subject-matter areas of animal, dairy, or poultry science.

Evaluation of Education: Course work in such subjects as agronomy, animal, dairy, or poultry science , biology, botany, zoology, microbiology, physiology, genetics, and biochemistry may be used to meet the general 30-semester-hour requirement in the basic biological and agricultural sciences.

Course work in such subjects as zoology, embryology, animal breeding or genetics, physiology , biochemistry, and any phase of animal, dairy, or poultry sc ience may be used to meet the 20-semester-hour requirement in animal science.

Course work in animal science includes those subjects dealing with the specific kinds and classes o f livestock, e.g., cattle, swine, sheep, or fur bearers, their breeding and development, nutrition, management, and utilization; and the qualities and uses of their products, e.g., meat, wool, or leather. Course work i n dairy science includes those subjects dealing with the specific kinds and classes of dairy animals; thei r nutrition and manageme nt; the utilization of their products; and courses dealing with the establishment of lineages, various phases of a dairy operation, milk quality, etc. ☞

GS-487 (Continued)

Course work in poultry science includes those subjects dealing with the kinds and classes of poultry; their breeding and development; the establishment of specific strains; their nutrition and management; the utilization of their products; and courses dealing with specific areas peculiar to poultry science, such as genetic or environmental factors, or rearrangement of cycles.

GS-493 Home Economics Series GS-493

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

Basic Requirements:

A. Degree: home economics; or a related discipline or field of science that included at least 20 semester hours in or directly applicable to foods and nutrition, home management and household economics, housing and household equipment, textiles and clothing, or child and family development.

OR

B. Combination of education and experience—courses equivalent to a major, or at least 20 semester hours in home economics, as shown in A above, plus appropriate experience or additional education.

Successful completion of a dietetic internship approved by the American Dietetic Association qualifies for appointment at the GS-7 level to home economics positions that are concerned primarily with work in nutrition, or in menu and food preparation.

GS-499 Biological Science Student Trainee Series GS-499

Use the "Group Coverage Qualification Standard for Competitive Service Student Trainee Positions," as appropriate to the appointing authority used.

GS-501 Financial Administration and Program Series GS-501

Use the "Group Coverage Qualification Standard for Administrative and Management Positions."

GS-503 Financial Clerical and Assistance Series GS-503

Use the "Group Coverage Qualification Standard for Clerical and Administrative Support Positions."